

R E M A R K S

Claim 1 as set forth in Appendix II of this paper is now pending in this case. Claim 1 has been amended as indicated in the Listing of Claims set forth in Appendix I of this paper.

Accordingly, the wording "if desired" has been replaced by the expression --optionally-- as suggested by the Examiner. No new matter has been added.

The Examiner rejected Claim 1 under Section 112, ¶2, as being indefinite due to the phrase "if desired". Applicants have adopted the change suggested by the Examiner. It is therefore respectfully requested that the rejection under 35 U.S.C. §112, ¶2, be withdrawn. Favorable action is solicited.

The Examiner rejected Claim 1 under 35 U.S.C. §103(a) as being unpatentable in light of the teaching of *Paquet et al.* (WO 93/25608) when taken in view of the disclosure of *Glück et al.* (US 5,880,166).

Applicants' invention relates to a process for the production of foam sheets which comprises extruding and foaming a mixture of a styrene polymer, from 3 to 15% by weight of a volatile blowing agent and from 0.2 to 10% by weight of graphite particles, and wherein the blowing agent is made of

from 95 to 30% by weight of CO<sub>2</sub>,

from 5 to 70% by weight of H<sub>2</sub>O, and

from 0 to 60% by weight of a volatile organic compound.

Applicants have found that, under the process conditions of applicants' invention, foam sheets are formed which are characterized by a monomodal foam structure. A monomodal foam structure has the advantage over a bimodal foam structure that operations which are conducted on the foam sheets, for example operations such as sawing, milling, cutting or embossing, are less difficult<sup>1)</sup>. Moreover, applicants have found that the foamed sheets obtained in accordance with applicants' invention have a lower thermal conductivity than foam sheets which are obtained under corresponding conditions but using carbon black instead of graphite<sup>2)</sup>.

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1) For example page 1, indicated line 44, to page 2, indicated line 3, of the application.

2) For example page 1, indicated line 44, to page 2, indicated line 3, in conjunction with the data concerning Examples 2 and 3, Table on page 4 of the application.

The teaching of *Paquet et al.* provides for the production of foamed sheets of styrene polymer wherein carbon black is used to lower the thermal conductivity. *Paquet et al.* also emphasize that the foam sheets which are obtained when carbon black is used have a bimodal foam structure, and that the bimodal foam structure provides for better insulation properties than a monomodal foam structure<sup>3)</sup>.

The disclosure of *Glück et al.* relates to rubber-modified styrene polymers and foams made therefrom, and provides that carbon black or graphite can be used for reducing the thermal conductivity of the foams.

The teaching of *Paquet et al.* when taken in view of the disclosure of *Glück et al.* cannot be considered to render applicants' invention obvious within the meaning of Section 103(a).

The invention as a whole which is referred to in Section 103(a) is not limited to the subject matter which is literally recited in the claim(s) in question. The invention as a whole also includes properties of the claimed subject matter which are inherent in the specific combination of requirements defined by the claim(s)<sup>4)</sup>. A person of ordinary skill in the art and looking at the teaching of *Paquet et al.* and the disclosure of *Glück et al.* would expect that replacing carbon black by graphite would yield similar properties provided that the bimodal foam structure is maintained. Moreover, in light of the statements made by *Paquet et al.*, a person of ordinary skill in the art would expect a foam having a monomodal foam structure to be disadvantageous due to a higher thermal conductivity.

Applicants' invention shows that neither one of those expectations is met. On the one hand, graphite and carbon black clearly cannot be considered as equivalents since utilization of carbon black provides for a bimodal foam structure whereas a monomodal foam structure is found when graphite is used. Furthermore, applicants' finding that the monomodal foam which is obtained with graphite has improved insulating properties is in clear contrast to the statements made by *Paquet et al.* Based on the teaching of *Paquet et al.* and the disclosure of *Glück et al.*, a person of ordinary skill in the art

- could not expect to arrive at a foam having monomodal foam structure, and
- could not expect to arrive at a foam having monomodal foam struc-

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3) For example page 12, indicated line 12 et seq., of *WO 93/25608*.

4) *In re Antonie*, 559 F.2d 618, 195 USPQ 6 (CCPA 1977)

ture and additionally improved insulating properties.

A person of ordinary skill in the art could therefore not arrive at applicants' invention "as a whole" based on the teaching of *Paqu t t al.* and the disclosure of *Glück et al.* Favorable reconsideration of the Examiner's position and withdrawal of the rejection under Section 103(a) is therefore respectfully solicited.

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Respectfully submitted,

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Encl.: THE LISTING OF CLAIMS (Appendix I)  
THE AMENDED CLAIMS (Appendix II)

HBK/BAS

## A P P E N D I X I:

THE LISTING OF CLAIMS (version with markings):

(currently amended) A process for producing foam sheets with a density of from 20 to 200 g·l<sup>-1</sup> and with a cross section of at least 50 cm<sup>3</sup> by extrusion and foaming of a mixture made from a styrene polymer, from 3 to 15% by weight of graphite particles, based in each case on the styrene polymer, [~~if desired~~] optionally with conventional additives, which comprises using a volatile blowing agent which is a mixture made of

from 95 to 30% by weight of CO<sub>2</sub>,

from 5 to 70% by weight of H<sub>2</sub>O, and

from 0 to 60% by weight of a volatile organic compound.